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TITLE: Surface mounting component fitting machine for industries, has operating unit to move static removal unit so as to lower electronic component which is to be mounted on substrate

PATENT-ASSIGNEE:

ASSIGNEE	CODE
TENRYU TECHNICS KK	TENRN

PRIORITY-DATA: 1999JP-0233630 (August 20, 1999) [Search Selected](#) [Search All](#) [Clear](#)**PATENT-FAMILY:**

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APPLICATION-DATA:

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INT-CL (IPC): H05F 3/02; H05K 13/04**ABSTRACTED-PUB-NO:** JP2001060794A**BASIC-ABSTRACT:**

NOVELTY - The electronic component (b) of feed zone is held by a holder (2) of a fitting head (1). A static removal unit (15) is provided to a movable unit (9) which is connected to the head. An operating unit (16) moves the static removal unit so that the component is lowered for fixing on substrate.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the surface mounting component fitting procedure.

USE - For mounting electronic components like chip, IC to substrate in industries.

ADVANTAGE - Prevents destruction of interior fitting of electronic components due to static charge in the electronic component. Improves time efficiency for mounting electronic component to the substrate. Enables attaining speed improvement by performing mounting process in a short time.

DESCRIPTION OF DRAWING(S) - The figure shows the enlarged side view of surface mounting component fitting machine.

Fitting head 1

Holder 2

Movable unit 9

Static removal unit 15

Operating unit 16

Electronic component b

CHOSEN-DRAWING: Dwg. 2/11

TITLE-TERMS: SURFACE MOUNT COMPONENT FIT MACHINE INDUSTRIAL OPERATE UNIT MOVE STATIC REMOVE UNIT SO LOWER ELECTRONIC COMPONENT MOUNT SUBSTRATE

DERWENT-CLASS: V04

EPI-CODES: V04-R04G;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N2001-199104

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to the surface mounted device wearing machine used in assembly, the industry with which it equips of electronic parts, and its approach.

[0002]

[Description of the Prior Art] If it is in wearing of the electronic parts in assembly, the industries with which it equips of electronic parts, such as a chip and IC components, to a substrate When a wearing head moves at high speed, it is what static electricity generated by contact friction with air is charged for electronic parts or an adsorption nozzle, and may destroy the electronic parts which are carrying out adsorption maintenance with this static electricity. Especially, this static electricity had the big fault from which the maintenance posture of electronic parts in which it adsorbed by the adsorption nozzle shifts owing to.

[0003] In order to cancel this fault conventionally, charged static electricity is made to discharge to a suction head by forming with the ingredient with which an adsorption nozzle part contains a conductive particle, that electrification is prevented or electronic-parts wearing to the circuit board is performed in a destaticization ambient atmosphere.

[0004] However, an antistatic policy is a koji ***** thing only to the adsorption nozzle to which each of these above mentioned techniques carries out adsorption maintenance of the electronic parts. Since the cure of electrification prevention is not made at all to static electricity charged in the electronic parts itself, while receiving the bad influence by this static electricity There was nothing to discharge while conveying to a substrate the electronic parts held by the adsorption nozzle simultaneous in electronic parts and an adsorption nozzle and to perform.

[0005] Since it is in the inclination for an assembly and wearing in a clean room to be performed and the indoor environment which works is excellently maintained by the air regulator etc. as especially electronic equipment carries out elaboration in recent years, works and indoor air are high dryness. If it was in an assembly and wearing in such an environment, it was what has the big trouble that static electricity generated by contact friction with air in case a wearing head moves at high speed is again charged in electronic parts.

[0006]

[Problem(s) to be Solved by the Invention] Were made in order that this invention might solve the above mentioned trouble, and hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from a feed zone to an applied part. In the process in which are in the surface mounted device wearing approach of equipping the predetermined location of the substrate in this applied part with electronic parts, form an electric discharge means in the movable object which attached the wearing head or this wearing head, and said electronic parts are conveyed from a feed zone to an applied part By making the electronic parts held by the electric discharge means at the attachment component and this attachment component discharge It aims at offering the surface mounted device wearing machine which can prevent poor wearing to the destruction and the substrate of electronic parts

resulting from static electricity charged in electronic parts or an attachment component, and its approach.

[0007]

[Means for Solving the Problem] The means of this invention for attaining the above mentioned purpose Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. The electric discharge means formed in the movable object which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and attached said wearing head or this wearing head, It is made to connect with this electric discharge means, and is in the configuration of the surface mounted device wearing machine made to be equipped with the actuation means to which this electric discharge means is moved to the electronic-parts bottom held at said attachment component.

[0008] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. After a detection means detects said electronic parts held by said attachment component during this conveyance, The electric discharge means formed in the movable object which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and attached said wearing head or this wearing head, Make it connect with this electric discharge means, and the actuation means to which this electric discharge means is moved to the electronic-parts bottom held at said attachment component is made to have. Said detection means It prepares in the movable object which attached said wearing head or this wearing head, a both-way means or said actuation means is connected to this detection means, and it is in the configuration of the surface mounted device wearing machine formed free [migration] to the electronic-parts bottom held at said attachment component.

[0009] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. The electric discharge means which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and was prepared for the airframe proper place of said surface mounted device wearing machine wearing, It is in the configuration of the surface mounted device wearing machine made to be equipped with the detection means formed in the movable object which attached said wearing head or this wearing head, and the both-way means to which this detection means is moved to the electronic-parts bottom which were connected to this detection means and held at said attachment component.

[0010] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. The electric discharge means formed in the movable object which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and attached said wearing head or this wearing head, It is made to connect with this electric discharge means, and is in the configuration of the surface mounted device wearing machine made to be equipped with the actuation means to which this electric discharge means is moved to the electronic-parts bottom held at said attachment component, and the detection means of the electronic parts held at said attachment component prepared for the airframe proper place of said surface mounted device wearing machine wearing.

[0011] And hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. It is in the surface mounted device wearing approach of equipping the predetermined location of the substrate in this applied part with said electronic parts. In the process in which form an electric discharge means in the movable object which attached said wearing head or this wearing head, and said electronic parts are conveyed from said feed zone to said applied part It is in the surface mounted device wearing approach of making said electronic parts held by said electric discharge means at said attachment component and this attachment component discharging.

[0012] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. It is in the surface mounted device wearing

approach of equipping the predetermined location of the substrate in this applied part with said electronic parts. In the process in which form an electric discharge means and a detection means in the movable object which attached said wearing head or this wearing head, and said electronic parts are conveyed from said feed zone to said applied part. It is in the surface mounted device wearing approach of performing the process which makes said electronic parts held by said electric discharge means at said attachment component and this attachment component discharging, and the process which makes the electronic parts held at said this discharged attachment component detecting with said detection means.

[0013] Two or more wearing heads are installed in the shape of a straight line to the movable object. The electric discharge process of said electric discharge means, and the detection process of said detection means Moving the lower part of the electronic parts held at said two or more wearing heads A series of continuous action which was parallel to the side-by-side installation direction of these wearing head to said wearing head of another flank outermost part from said wearing head of the one flank outermost part arranged in the shape of [said] a straight line performs electric discharge of said electronic parts, and detection of said electronic parts.

[0014]

[Example] Next, an example of operation of the surface mounted device wearing machine about this invention and its approach is explained based on a drawing. After the detection means 3 detects the electronic parts b which A is a surface mounted device wearing machine, held the electronic parts b, such as a chip, IC components, etc. of a feed zone m, by the attachment component 2 of the wearing head 1, conveyed from the feed zone m to the applied part n, and were held by the attachment component 2 during this conveyance in drawing 1 - drawing 4 and drawing 6 - drawing 11, the predetermined location on printed circuit board c in this applied part n is equipped with electronic parts b.

[0015] In addition, it has the electronic-parts feeder by various feeders, such as a tray on which the above mentioned feed zone m was formed in the 1 side in an airframe 4, or both sides, a stick, and a tape, etc. Moreover, in an airframe 4, carrying-in appearance of the printed circuit board c is carried out by the conveyance means 5, and wearing of electronic parts b is performed to the above mentioned applied part n.

[0016] And as the above mentioned surface mounted device wearing machine A is shown in drawing 1, drawing 2, etc. The attitude object 7 which attaches in an airframe 4 and moves to a cross direction (X shaft orientations) with the attitude means 6 at arbitration, While making the wearing head 1 engaged free [rise and fall] with the rise-and-fall means 10 to the movable object 9 which attaches in this attitude object 7 and moves to a longitudinal direction (Y shaft orientations) with the migration means 8 at arbitration, and this movable object 9 Rotation of this wearing head 1 is enabled centering on the direction of an axis of ordinate with the rotation means 11, with the servo motor in which numerical control is possible, through a control means 12, a means 6, and each 8, 10 and 11 are highly precise, and they operate.

[0017] In addition, on this wearing head 1, although it is prepared in the state of immobilization and the attachment components 2, such as an adsorption nozzle type which adsorbs the top face of electronic parts b, and a chuck type which grasps that periphery, may be [that attachment and detachment are free or] single heads, if it constitutes on two or more heads (for example, five to 6 head) as shown in drawing 1 or drawing 5, wearing effectiveness etc. will improve.

[0018] The above mentioned detection means 3 detects a class, its maintenance condition, etc. of the electronic parts b held at the attachment component 2, recognizes and captures the image of electronic parts b using the optical means (laser) which consists of sensors, such as a CCD camera, and the exposure section and the light sensing portion of a parallel ray, and transmits it to the control means 12 which consists of a computer of common use of this detecting signal.

[0019] Moreover, if this detection means 3 is in the example shown in drawing 2 It has prepared in the attachment object 14 attached through the both-way means 13 to the movable object 9 which attached the wearing head 1 or this wearing head 1. This both-way means 13 It is controlled by the servo motor in

which numerical control is possible, and it is attached so that attitude movement of the lower part of this wearing head 1 may be carried out by a series of continuous action or intermittent control actions in parallel with juxtaposition of this wearing head 1 to a longitudinal direction (X shaft orientations, the direction of P shown by the arrow head in drawing 5).

[0020] Moreover, the electric discharge means 15 is formed in the movable object 9 which attached the wearing head 1 or this wearing head 1, it is made to discharge the electronic parts b held at the attachment component 2 and this attachment component 2, and the configuration is spraying the ionized air on an attachment component 2 and this attachment component 2 for example, and removes static electricity charged in these. in addition, it comes out not to mention the part which carries out the neighborhood to an attachment component 2, a member, etc. being discharged, and is, and further, if this electric discharge means 15 is a means by which the electric system which has a bad influence to wearing of the electronic parts b, such as static electricity, and these electronic parts b is removable, the thing of arbitration can adopt it.

[0021] If this electric discharge means 15 is in the example shown in drawing 2 - drawing 5 It has prepared in the attachment object 17 attached through the actuation means 16 to the movable object 9 which attached the wearing head 1 or this wearing head 1. This actuation means 16 It is controlled by the servo motor in which numerical control is possible, and are parallel to juxtaposition of this wearing head 1 in the lower part of this wearing head 1. It is attached in the longitudinal direction (X shaft orientations, the direction of P shown by the arrow head in drawing 5) used as the direction of the same axis so that attitude movement may be carried out by a series of continuous action or intermittent control actions.

[0022] In addition, as shown in drawing 2 and drawing 3 , the actuation means 16 may use movement by the both-way means 13 of the above mentioned detection means 3 (combination), and attaches the electric discharge means 15 in the attachment object 14 which attached the detection means 3 in this case. As this actuation means 16 is shown in drawing 4 with a natural thing, attach in the wearing head 1, the both-way means 13 can also adopt the means which carries out transit movement according to an individual, and it is made to align with the both-way means 13 in this case, and it is made to operate or only the actuation means 16 or the both-way means 13 is operated independently.

[0023] In addition, a lighting means 20 to emit light in case the above mentioned detection means 3 detects electronic parts b is attached. Furthermore, the location detecting-element material 21 which regulates the luminescence location and the luminescence time amount of this lighting means 20 is formed, the photoelectric tube, a proximity switch, etc. are used, the sensor 22 who each wearing head 1 is made to correspond to the movable object 9, for example, regulates **** initiation and a **** halt of the lighting means 20 is attached, and the detection object 23 corresponding to this sensor 22 has been formed in the attachment object 14.

[0024] Moreover, the range location detecting-element material 25 which regulates the transit range is formed in the actuation means 16. In addition, when combination use of this actuation means 16 is carried out with the both-way means 13, the above mentioned location detecting-element material 21 may be used for this range location detecting-element material 25.

[0025] Therefore, the operation of the surface mounted device wearing machine A concerning this invention and one example of the approach is as follows. If electronic parts b are equipped with the predetermined number by the proper place, respectively and are in this activity, various data, such as these set points and sequence of operation, are memorized beforehand to the control means 12 at Substrate c top.

[0026] And wearing of the electronic parts b operates the attitude means 6 and the migration means 8, the rise-and-fall means 10, and the rotation means 11, moves the wearing head 1 to the feed zone m which is preparing electronic parts b, and makes electronic parts b receive by the attachment component 2 of each of this wearing head 1, respectively.

[0027] Next, when combination use of the both-way means 13 and the actuation means 16 as shown in drawing 2 and drawing 3 , and drawing 5 is carried out In the process which the wearing head 1 holding electronic parts b moves to an applied part n As opposed to the wearing head 1 of the other flank

outermost part from the wearing head 1 of an one flank outermost part in which this detection means 3 and the electric discharge means 15 which the both-way means 13 (actuation means 16) operated, and were attached in the attachment objects 14 and 17 were arranged in the shape of [the] a straight line. These wearing heads 1, 1, and 1 -- In parallel with the side-by-side installation direction, it moves continuously.

[0028] Therefore, the electric discharge means 15 attached in the attachment objects 14 and 17 operates first, and the air ionized to the inferior surface of tongue of the electronic parts b which the attachment component 2 in the wearing head 1 holds is sprayed in the shape of a shower. Then, that charge is neutralized by said ionized air and static electricity charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is removed.

[0029] In addition, if it is in this electric discharge process, it is what the electric discharge means 15 can be beforehand operated before going electronic parts b reception to a feed zone m, and can also be discharged to an attachment component 2 and the neighborhood of this attachment component 2. When the defect adsorption by static electricity can be decreased, another electric discharge means 15 is arranged in the proper place of the wearing head 1 at the time of maintenance of the electronic parts b by the attachment component 3 and it reaches to a feed zone m, The air ionized to the electronic parts b which stand by in this feed zone m may be sprayed in the shape of a shower.

[0030] The wearing head 1 which finished the electric discharge process by this electric discharge means 15 Detection of the electronic parts b currently held at the attachment component 2 is performed by detection means 3 by which this electric discharge means 15 is interlocked with. This detecting signal is immediately sent to a control means 12, based on an operation with the data inputted beforehand, performs image information processing of these electronic parts b etc., acquires an amendment numeric value, and amends the coordinate value and theta include-angle value of the XY direction over wearing of electronic parts b.

[0031] The electric discharge process and detection process which were described above to other wearing heads 1 one after another are performed, all actuation is performed into the process which moves electronic parts b to reception and an applied part n in a feed zone m, and these processes are ended.

[0032] And the wearing head 1 which reached the applied part n equips with the electronic parts b currently held to the attachment component 2 along with the plug ram of a control means 12 to Substrate c immediately, goes, and does not have the loss of a tact time. Moreover, in the process which actuation called electric discharge, detection, amendment, and wearing moves to an applied part n from maintenance of electronic parts b by preparing so that the detection means 3 by the both-way means 13 may be interlocked with, a single string can perform migration of the electric discharge means 15 by the shortest time amount efficiently.

[0033] Although that in which it is in the above mentioned example, combination use of the both-way means 13 and the actuation means 16 is carried out, and this detection means 3 and the electric-discharge means 15 carry out interlocking transit was shown, the both-way means 13 and the actuation means 16 operate separately, and as shown to drawing 4, even if it is the configuration that this detection means 3 and the electric-discharge means 15 run according to an individual, the same operation effectiveness demonstrates.

[0034] drawing 6 and drawing 7 -- what is and shows other examples of attachment of the detection means 3 in the surface mounted device wearing machine A, and the electric discharge means 15 -- it is -- these detection means 3 or the electric-discharge means 15 -- the movable object 9 with which that either attached the wearing head 1 or this wearing head 1 -- preparing -- **** -- moreover, the detection means 3 or the electric-discharge means 15 -- it is the configuration which that either attached in the proper place of an airframe 4.

[0035] Namely, in the surface mounted device wearing machine A shown in drawing 6, the electric discharge means 15 is attached in the movable object 9 which attached the wearing head 1 through the actuation means 16 to the attachment object 17, enabling free migration, and it is attached in the proper place of an airframe 4 for the detection means 3 through the both-way means 13, enabling free

migration.

[0036] Therefore, in a feed zone m, static electricity with which the air ionized by electric discharge means 15 to run this electronic-parts b bottom with the actuation means 16 was sprayed, and was charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is removed in the process which the electronic parts b held by each attachment component 2 of two or more wearing heads 1 move to an applied part n.

[0037] Moreover, it stops in the location of the detection means 3 established while having moved to the applied part n, or it detects each electronic parts b with a detection means 3 run this electronic-parts b bottom with the both-way means 13, and the wearing head 1 holding these electronic parts b performs predetermined amendment processing, moving so that it may be parallel to the transit direction of the detection means 3, as described above based on this detecting signal.

[0038] For this reason, since all actuation is performed into that process that moves electronic parts b to reception and an applied part n in a feed zone m and it ends, the process of an electric discharge process and a detection process is sharply ****(ed) compared with the case where the wearing tact time of electronic parts b performs separately a conventional electric discharge process and a conventional detection process.

[0039] Moreover, in the surface mounted device wearing machine A shown in drawing 7, the detection means 3 is attached in the movable object 9 which attached the wearing head 1 through the both-way means 13 to the attachment object 14, enabling free migration, and it is attached in the proper place of an airframe 4 for the electric discharge means 15 through the actuation means 16, enabling free migration.

[0040] In a feed zone m, therefore, the electronic parts b held by each attachment component 2 of two or more wearing heads 1 Stop in the location of the electric discharge means 15 established in the process which moves to an applied part n while having moved to the applied part n, or, moving so that it may be parallel to the transit direction of the electric discharge means 15 The air ionized by electric discharge means 15 to run this electronic-parts b bottom with the actuation means 16 is sprayed, and static electricity charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is removed.

[0041] Moreover, in the process which moves to an applied part n, the detection means 3 attached in the movable object 9 runs this electronic-parts b bottom with the both-way means 13, and the wearing head 1 holding these electronic parts b detects each electronic parts b, and as described above based on this detecting signal, it performs predetermined amendment processing.

[0042] For this reason, since all actuation is performed into that process that moves electronic parts b to reception and an applied part n in a feed zone m and it ends, the process of an electric discharge process and a detection process is sharply ****(ed) compared with the case where the wearing tact time of electronic parts b performs separately a conventional electric discharge process and a conventional detection process.

[0043] The detection means 3 and the electric discharge means 15 which are in the electric discharge process and detection process which are shown in this drawing 6 and drawing 7, and were attached in the airframe 4 It is not necessary to necessarily move to a longitudinal direction with the both-way means 13 and the actuation means 16, respectively, and is that as which in a fixed condition is sufficient in an airframe 4. In this case two or more wearing heads 1 each It is positioned by the attitude means 6 and the migration means 8 in the attaching position of this detection means 3 in an airframe 4, or the electric discharge means 15, and the same above mentioned electric discharge process and the above mentioned detection process are performed by moving two or more wearing heads 1 each to a longitudinal direction through the movable object 9 by the mobile 8.

[0044] In the surface mounted device wearing machine A in drawing 8, the detection means 3 and the electric discharge means 15 are attached in the proper place of an airframe 4 through the both-way means 13 and the actuation means 16 (even if the actuation means 16 carries out combination use with the both-way means 13, it is good.), enabling free migration.

[0045] In a feed zone m, therefore, the electronic parts b held by each attachment component 2 of two or

more wearing heads 1 Stop in the location of the electric discharge means 15 established in the process which moves to an applied part n while having moved to the applied part n, and the detection means 3, or, moving so that it may be parallel to the transit direction of the electric discharge means 15 and the detection means 3 This electronic-parts b bottom with the electric discharge means 15 and the detection means 3 it runs with the both-way means 13 and the actuation means 16 First, the ionized air is sprayed in the shape of a shower, and removal of static electricity charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is performed.

[0046] If the electric discharge process of the first wearing head 1 is completed, to the wearing head 1 holding these electronic parts b, with a detection means 3 to run with the both-way means 13, electronic parts b will be detected in a series of locomotive movements, and as described above based on this detecting signal, predetermined amendment processing will be performed. Thus, an electric discharge process and a detection process are similarly performed in the continuous flow to other wearing heads 1.

[0047] For this reason, in that process that moves electronic parts b to reception and an applied part n in a feed zone m, since all actuation is performed and it ends, the process of an electric discharge process and a detection process is sharply ****(ed) compared with the case where the wearing tact time of electronic parts b performs separately a conventional electric discharge process and a conventional detection process.

[0048] The detection means 3 and the electric discharge means 15 which are in the electric discharge process and detection process which are shown in this drawing 8, and were attached in the airframe 4 It is not necessary to make it move to a longitudinal direction (X shaft orientations) with the both-way means 13 and the actuation means 16, respectively, and is not necessarily that as which in a fixed condition (not shown) is sufficient in an airframe 4. In this case, two or more wearing heads 1 each are positioned by the attitude means 6 and the migration means 8 in the attaching position of this detection means 3 in an airframe 4, or the electric discharge means 15. By moving two or more wearing heads 1 each to a longitudinal direction (X shaft orientations) through the movable object 9 with the migration means 8, the same above mentioned electric discharge process and the above mentioned detection process are performed.

[0049] In the surface mounted device wearing machine A in drawing 9, the attachment object 30 is fixed to the proper place of the attitude object 7 which moves to a cross direction with the attitude means 6 at arbitration, and it has attached it in it for the detection means 3 and the electric discharge means 15 at this attachment object 30, enabling free migration.

[0050] Therefore, in a feed zone m, the wearing head 1 attached in the movable object 9 moves the electronic parts b held by each attachment component 2 of two or more wearing heads 1 to a longitudinal direction with the migration means 8 in the process which moves to an applied part n to the electric discharge means 15 and the detection means 3 which were attached in the attitude object 7.

[0051] At this time, to the first wearing head 1 in this migration condition, first, the ionized air is sprayed by the electric discharge means 15 in the shape of a shower, and removal of static electricity charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is performed by it.

[0052] With the detection means 3 attached in one with the electric discharge means 15 to the wearing head 1 which the electric discharge which moves to coincidence ended, electronic parts b are detected in a series of locomotive movements of the wearing head 1, and as described above based on this detecting signal, predetermined amendment processing is performed. Thus, an electric discharge process and a detection process are similarly performed in the continuous flow to other wearing heads 1.

[0053] For this reason, since all actuation is performed into that process that moves electronic parts b to reception and an applied part n in a feed zone m and it ends, the process of an electric discharge process and a detection process is sharply ****(ed) compared with the case where the wearing tact time of electronic parts b performs separately a conventional electric discharge process and a conventional detection process.

[0054] drawing 10 and drawing 11 -- what shows other examples of attachment of the detection means 3

in the surface mounted device wearing machine A which is and is shown in drawing 9, and the electric-discharge means 15 -- it is -- these detection means 3 or the electric-discharge means 15 -- the attitude object 7 to which that either is moved by the attitude means 6 approximately -- preparing -- *** -- moreover, a detection means 3 or an electric-discharge means 15 -- it is the configuration which that either attached in the proper place of an airframe 4.

[0055] Namely, in the surface mounted device wearing machine A shown in drawing 10, the electric discharge means 15 is fixed to the attitude object 7 through the attachment object 30, and it has attached it in the proper place of an airframe 4 for the detection means 3 through the both-way means 13, enabling free migration.

[0056] Therefore, in a feed zone m, the electronic parts b held by each attachment component 2 of two or more wearing heads 1 are that the movable object 9 moves to a longitudinal direction with the migration means 8 in the process which moves to an applied part n, and the electronic-parts b bottom runs the electric discharge means 15 top fixed to the attitude object 7. At this time, the air ionized by the electric discharge means 15 is sprayed, and static electricity charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is removed.

[0057] Moreover, it stops in the location of the detection means 3 established while having moved to the applied part n, or it detects each electronic parts b with a detection means 3 run this electronic-parts b bottom with a both-way means 13, and as having described above based on this detecting signal, it carries out predetermined amendment processing, the wearing head 1 holding the electronic parts b which finished this electric discharge moving so that it is parallel to the transit direction of the detection means 3.

[0058] For this reason, since all actuation is performed into that process that moves electronic parts b to reception and an applied part n in a feed zone m and it ends, the process of an electric discharge process and a detection process is sharply *** (ed) compared with the case where the wearing tact time of electronic parts b performs separately a conventional electric discharge process and a conventional detection process.

[0059] Moreover, in the surface mounted device wearing machine A shown in drawing 11, the detection means 3 is fixed to the attitude object 7 through the attachment object 30, and it has attached it in the proper place of an airframe 4 for the electric discharge means 15 through the actuation means 16, enabling free migration.

[0060] In a feed zone m, therefore, the electronic parts b held by each attachment component 2 of two or more wearing heads 1 Stop in the location of the electric discharge means 15 established in the process which moves to an applied part n while having moved to the applied part n, or, moving so that it may be parallel to the transit direction of the electric discharge means 15 The air ionized by electric discharge means 15 to run this electronic-parts b bottom with the actuation means 16 is sprayed, and static electricity charged in these electronic parts b and an attachment component 2, or the neighborhood of this attachment component 2 is removed.

[0061] Moreover, in the process which moves to an applied part n, to the detection means 3 attached in the attitude object 7, in the wearing head 1 holding these electronic parts b, this electronic-parts b bottom runs with the migration means 8, and it detects each electronic parts b, and as described above based on this detecting signal, it performs predetermined amendment processing.

[0062] For this reason, since all actuation is performed into that process that moves electronic parts b to reception and an applied part n in a feed zone m and it ends, the process of an electric discharge process and a detection process is sharply *** (ed) compared with the case where the wearing tact time of electronic parts b performs separately a conventional electric discharge process and a conventional detection process.

[0063] Even if it is in the electric discharge process and detection process which are shown in this drawing 10 and drawing 11, the detection means 3 and the electric discharge means 15 which were attached in the airframe 4 It is not necessary to make it move to a longitudinal direction (X shaft orientations) with the both-way means 13 and the actuation means 16, respectively, and is not necessarily that as which in a fixed condition (not shown) is sufficient in the proper place of an airframe

4. In this case, two or more wearing heads 1 each are positioned by the attitude means 6 and the migration means 8 in the attaching position of this detection means 3 in an airframe 4, or the electric discharge means 15. By moving two or more wearing heads 1 each to a longitudinal direction (X shaft orientations) through the movable object 9 with the migration means 8, the same above mentioned electric discharge process and the above mentioned detection process are performed.

[0064]

[Effect of the Invention] As mentioned above, since said electronic parts and an attachment component, or static electricity charged in the neighborhood of this attachment component is removed, the surface mounted device wearing machine of this invention and its approach can prevent destruction of the poor wearing and electronic parts with which static electricity originates on the occasion of wearing of electronic parts in the process which is made to hold electronic parts on a wearing head, and moves to an applied part. Moreover, in the process which is made to hold electronic parts on a wearing head, and moves to an applied part, since information can be processed in electronic parts, the time amount effectiveness of wearing of the electronic parts to a substrate can improve sharply, the improvement in the speed can be attained, and a lot of wearing processing can be performed in a short time. The exceptional effectiveness of ** is done so.

*** NOTICES ***

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CLAIMS

[Claim(s)]

[Claim 1] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. The electric discharge means formed in the movable object which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and attached said wearing head or this wearing head. The surface mounted device wearing machine characterized by making the actuation means to which this electric discharge means is moved to the electronic-parts bottom which were connected to this electric discharge means and held at said attachment component have.

[Claim 2] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. After a detection means detects said electronic parts held by said attachment component during this conveyance, The electric discharge means formed in the movable object which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and attached said wearing head or this wearing head, Make it connect with this electric discharge means, and the actuation means to which this electric discharge means is moved to the electronic-parts bottom held at said attachment component is made to have. Said detection means The surface mounted device wearing machine characterized by having prepared in the movable object which attached said wearing head or this wearing head, and preparing free [migration] to the electronic-parts bottom which were made to connect a both-way means or said actuation means to this detection means, and were held at said attachment component.

[Claim 3] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. The electric discharge means which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and was prepared for the airframe proper place of said surface mounted device wearing machine wearing, The surface mounted device wearing machine characterized by making the detection means formed in the movable object which attached said wearing head or this wearing head, and the both-way means to which this detection means is moved to the electronic-parts bottom which were connected to this detection means and held at said attachment component have.

[Claim 4] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. The electric discharge means formed in the movable object which is in the surface mounted device wearing machine which equips the predetermined location of the substrate in this applied part with said electronic parts, and attached said wearing head or this wearing head, The actuation means to which this electric discharge means is moved to the electronic-parts bottom which were connected to this electric discharge means and held at said attachment component, The surface mounted device wearing machine characterized by making the detection means of the electronic parts held at said attachment component prepared for the airframe

proper place of said surface mounted device wearing machine wearing have.

[Claim 5] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. It is in the surface mounted device wearing approach of equipping the predetermined location of the substrate in this applied part with said electronic parts. In the process in which form an electric discharge means in the movable object which attached said wearing head or this wearing head, and said electronic parts are conveyed from said feed zone to said applied part. The surface mounted device wearing approach characterized by making said electronic parts held by said electric discharge means at said attachment component and this attachment component discharge.

[Claim 6] Hold the electronic parts of a feed zone by the attachment component of a wearing head, and they are conveyed from said feed zone to an applied part. It is in the surface mounted device wearing approach of equipping the predetermined location of the substrate in this applied part with said electronic parts. In the process in which form an electric discharge means and a detection means in the movable object which attached said wearing head or this wearing head, and said electronic parts are conveyed from said feed zone to said applied part. The surface mounted device wearing approach characterized by performing the process which makes said electronic parts held by said electric discharge means at said attachment component and this attachment component discharge, and the process which makes the electronic parts held at said this discharged attachment component detect with said detection means.

[Claim 7] Two or more wearing heads are installed in the shape of a straight line to the movable object. The electric discharge process of said electric discharge means, and the detection process of said detection means Moving the lower part of the electronic parts held at said two or more wearing heads By a series of continuous action which was parallel to the side-by-side installation direction of these wearing head to said wearing head of another flank outermost part from said wearing head of the one flank outermost part arranged in the shape of [said] a straight line The surface mounted device wearing approach according to claim 6 characterized by performing electric discharge of said electronic parts, and detection of said electronic parts.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the top view showing the outline of one example of the surface mounted device wearing machine which adopted the surface mounted device wearing approach about this invention.

[Drawing 2] It is the expansion side elevation showing the surface mounted device wearing machine in drawing 1.

[Drawing 3] It is the expansion side elevation showing only an electric discharge means in the surface mounted device wearing machine in drawing 2.

[Drawing 4] It is the expansion side elevation showing the example of further others of the surface mounted device wearing machine in drawing 2.

[Drawing 5] It is the perspective view of the important section in drawing 2.

[Drawing 6] It is the expansion side elevation showing the example which attached the detection means and electric discharge means in drawing 1 in the attitude object.

[Drawing 7] It is the expansion side elevation showing other examples of the surface mounted device wearing machine in drawing 6.

[Drawing 8] It is the expansion side elevation showing the example which attached the detection means and electric discharge means in drawing 1 in the airframe.

[Drawing 9] It is the expansion side elevation showing other examples which attached the detection means and electric discharge means in drawing 1 in the attitude object.

[Drawing 10] It is the expansion side elevation showing other examples of the surface mounted device wearing machine in drawing 9.

[Drawing 11] It is the expansion side elevation showing the example of further others of the surface mounted device wearing machine in drawing 9.

[Description of Notations]

A Surface mounted device wearing machine

b Electronic parts

c Substrate

m Feed zone

n Applied part

1 Wearing Head

2 Attachment Component

3 Detection Means

4 Airframe

9 Movable Object

13 Both-way Means

15 Electric Discharge Means

16 Actuation Means

[Translation done.]